

[illegible]

5 The present invention provides a method for producing a mass-coded combinatorial library comprising a set of compounds having the general formula  $X(Y)_n$ , where X is a scaffold, each Y is, independently, a peripheral moiety, and n is an integer greater than 1.

0 The method comprises selecting a peripheral moiety precursor subset from a peripheral moiety precursor set. The subset includes a sufficient number of peripheral moiety precursors that at least about 50 distinct combinations of n peripheral moieties derived from the

5 peripheral moiety precursors in the subset exist. The subset of peripheral moiety precursors is selected so that at least about 90% of all possible combinations of n peripheral moieties derived from the subset have a molecular mass sum which is distinct from the molecular

0 mass sums of all of the other combinations of n peripheral moieties. The method further comprises contacting the peripheral moiety precursor subset with a scaffold precursor which has n reactive groups.

Methods of use of the mass-coded combinatorial library produced by this method for identifying a ligand to a

5 particular biomolecule are also disclosed.